



First results from ANKE cell-target data

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Data and results

Measurements:

November			
test with CH ₂		COOO Mev	
February	2006: polarized H jet	@600 MeV	
March	2006: cell with unpolarized H ₂ and	@831 MaV	
	background study with N ₂	eosi mev	
<u>Results:</u>			

- target density with jet and cell
- ABS jet polarization
- background from the cell in 3–body reactions

Measurement of pp \rightarrow d π^+



Known large $d\sigma/d\Omega$ and A_{γ}^{p} are used to get the gas density and polarization

Vertex reconstruction by pp $\rightarrow d\pi^+$ *with CH*₂ *target*



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Vertex reconstruction by pp $\rightarrow d\pi^+$ *with storage cell*



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Target thickness



Method	Jet [atoms/cm ²]	Storage Cell [atoms/cm ²]
ABS flux (+ cell geometry)	(1.6±0.1)·10 ¹¹	(1.9±0.1)·10 ¹³
Rates (pp→dπ+)	(1.5±0.1)·10 ¹¹	(2.1±0.1)·10 ¹³

Vertex reconstruction with single particle

Two-body reactions pp \rightarrow pp and pp \rightarrow d(0⁰) π ⁺



Target polarization



Background from cell walls in 3-body processes

Use of Nitrogen gas in the cell to obtain background from interactions with the cell wall

The cell was fed with H_2 or N_{2} :

- H₂ flux adjusted to match target chamber pressure flux of 1 HFS.
- N₂ flux adjusted to yield the same energy loss per unit of time in COSY compared to H₂, i.e. a similar beam heating.



Missing mass in 3-body processes with H_2 *and* N_2 *targets*



Stochastical cooling reduses background fraction by 5-10 %

Identification of three-body final states with cell at ANKE is possible

$dp \rightarrow (pp)n$ with cell: missing mass resolution



simulation

Variation of missing mass is comparable with M_{x} resolution with point-like target

$dp \rightarrow (pp)n$ with cell: resolution in excitation energy T_{pp}

simulation



 T_{pp} resolution does not change compared to point-like target case

Summary

- High intensity beam can be stored with the cell with help of electron and/or stochastic cooling (talk by Ralf Engels)
- Target thickness of (1.5±0.1)·10¹¹ atoms/cm² with the jet and (2.1±0.1)·10¹³ atoms/cm² with the cell is achieved. The rest gas background is tolerable.
- ABS jet polarization of $P_{av}=0.44\pm0.03$ is achieved, close to expectations.
- Identification of three-body final states with long cell at ANKE is possible.